

Replace the paragraphs starting on lines 9 and lines 15 of page 10 with the following paragraphs as marked up.

According to the preferred embodiment, the reinforcing ring 20 is made of a rigid material, such as steel, but may be made of any other suitable material such as nylon or plastic. The width of the reinforcing ring 20 is only that that is necessary to support the inner sleeve [40'] 40 concentric with the area of peak crimp force 36. The reinforcing ring is as discrete as possible and is therefore not subject to beam deflection as are reinforcements of the prior art.

Still referring to Fig. 2, the outer diameter of the reinforcing [member] ring 20 is slightly larger than the inner diameter 50 of the inner sleeve 40. The reinforcing [member] ring 20 is press fit into the inner diameter 50 of the inner sleeve 40. The press-fit may be controlled by a stop on a mandrel press (not shown), to ensure the reinforcing member 20 is properly located within the inner sleeve 40.

In the Claims

Please amend Claim 6 as follows:

6. (Amended) A hose coupling having an area of peak crimp force, said hose coupling comprising[;]:

an inner sleeve having a first end, a second end opposite said first end, and a pair of annular upset beads therebetween, said inner sleeve further having an inner diameter and an outer diameter thereon, said inner diameter having at least one groove therein, said outer diameter having at least one projection thereon;

a hose having an inner diameter positioned over said outer diameter of said inner sleeve, wherein said at least one projection of said inner sleeve interlocks with said hose to resist axial movement of said hose relative to said hose coupling;

an outer sleeve having a terminating end sandwiched between said pair of annular upset beads of said inner sleeve, said outer sleeve further having an inner diameter circumscribing said hose, said inner diameter of said outer sleeve further having at least one depression formed by a crimping operation, said at least one depression being concentric with said at least one groove of said inner sleeve, wherein said at least one depression interlocks with said hose to further resist axial movement of said hose relative to said hose coupling; and

a reinforcing ring positioned within said at least one groove in said inner diameter of said inner sleeve and concentric with said area of peak crimp force, whereby said reinforcing ring resists deformation of said inner sleeve during said crimping operation, said reinforcing ring having an inner diameter at least as great as said inner diameter of said inner sleeve, whereby said reinforcing ring permits full cross sectional fluid flow through said hose coupling.

In the Abstract

ABSTRACT

A hose coupling using at least one reinforcing ring to reinforce a hose coupling during a crimping process, the hose coupling having an inner sleeve, an outer sleeve coaxial with the inner sleeve, and a hose coaxially interposed therebetween. During the crimping process a crimping force is applied directly to the outer sleeve to form at least one depression that results in an area of peak crimp force on the inner sleeve, the depression helping to seal and lock the hose between the inner and outer sleeves. The reinforcing ring is positioned within the inner sleeve and concentric with the area of peak crimp force on the inner sleeve. Consequently, the reinforcing ring prevents the inner sleeve from deforming under the crimping force, thereby ensuring the integrity and long-term durability of the hose

coupling. The reinforcing ring preferably has an inside diameter equal to or greater than an inside diameter of the inner sleeve and is disposed within at least one groove located within the inner sleeve to permit unrestricted fluid flow through the hose coupling.

In the Drawings

Applicant's agent notes the objection by the Examiner regarding the reference numerals. The necessary amendments are indicated in red on the attached marked-up copies of the drawings as originally filed. Two marked up copies are enclosed to facilitate this request, and a separate letter to the Official Draftsperson in accordance with MPEP 608.02(r) is enclosed herewith. The undersigned will have the drawings corrected in an approved manner upon receiving the Examiner's approval of the above requested corrections. No new matter has been added. Reconsideration and withdrawal of the objections to the drawings in this application are, therefore, respectfully requested.

Remarks

The Office Action of April 30, 2001, Paper No. 6, was carefully reviewed and Applicant's agent acknowledges and appreciates the Examiner's close attention to the corrections required in the drawings and specification. Applicant's agent also appreciatively acknowledges the Examiner's allowance of Claims 6 through 10.

The specification was amended herein to make the correction noted by the Examiner and to correct matters of a grammatical and typographical nature. No new matter was presented and such amendments are deemed unobjectionable. Entry thereof is respectfully requested. It is also respectfully requested that the Examiner reconsider the present application and claims as currently pending in view of the following remarks.

In the Office Action, the Examiner objected to Figure 2, asserting that the reinforcing ring is not positioned concentric to the depressions. Applicant's agent respectfully asserts that the reinforcing ring need not be placed concentric to the depressions, unless such placement is concentric with a predicted area of peak crimp force.

According to the claims and specification, it is particularly pointed out that a reinforcing ring is positioned concentric with an area of peak crimp force of the hose coupling. In reading the claims in light of the specification, it should be pointed out that the area of peak crimp force is different for, and dependent on, each unique design of a given hose coupling. Page 5, lines 13 through 19, and page 9, lines 16 through 21 of the specification are particularly instructive in this regard. Therefore, according to the specification the reinforcing ring shares a common center with the area of peak crimp force, and not necessarily with depressions of an outer sleeve.

In determining the exact location of the peak crimp force for a given hose coupling design, one simply refers to the specification, or uses the drawings for instruction. In the preferred embodiment of Figure 5, Applicant believes that the area of peak crimp force is directly concentric with the depressions in the outer sleeve and, therefore, the reinforcing rings are positioned concentric therewith. In contrast, however, in the embodiment of Figure 2, Applicant believes that the areas of peak crimp force 36 are located between, and not concentric with, the depressions 66 in the outer sleeve, and therefore the reinforcing rings are positioned therebetween, and not concentric therewith.

Therefore, it is clear that the specification and independent claims broadly set forth that the reinforcing ring can be positioned concentrically (in axial alignment) with the depressions (crimps), or can be positioned between the depressions – depending upon which position is concentric with the area of peak crimp force. It is also clear that the

recited reinforcement will result since the reinforcement ring will be positioned concentric with the area of peak crimp force to provide a maximum concentration of reinforcement within the inner sleeve. Applicant's agent respectfully submits that Figure 2 is correct and in accord with the teachings and disclosure of Applicant's specification and claims. Accordingly, reconsideration and withdrawal of the objection to Figure 2 is respectfully requested.

Additionally, the Examiner rejected Claims 1 through 5, 11, and 12 under 35 U.S.C. §102(b) as being anticipated by Joseph et al., U.S. Patent 5,387,016. In rejecting the above claims, the Examiner asserted that Joseph et al. disclose a hose, an outer sleeve, an inner sleeve, and a reinforcing "ring". The undersigned agent respectfully traverses the Examiner's rejection of Claims 1 through 5, 11, and 12 in view of the following argument for the reason that the claims are not anticipated by Joseph et al.

The test for determining if a reference anticipates a claim, for purposes of a rejection under 35 U.S.C. §102, is whether the reference discloses all the elements of the claimed combination, or the mechanical equivalents thereof, functioning in substantially the same way to produce substantially the same results. As noted by the Court of Appeals of the Federal Circuit in *Lindemann Maschinenfabrick GmbH v. American Hoist and Derrick Co.*, 221 USQ 481, 485 (Fed. Cir. 1984), in evaluating the sufficiency of an anticipation rejection under 35 U.S.C. §102, the Court stated:

"Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim."

Applicant's independent Claim 1 requires:

"A hose coupling having an area of peak crimp force, said hose coupling comprising:
an inner sleeve...having an inner diameter...;

a hose...;
an outer sleeve...;
a reinforcing ring positioned within said inner diameter of
said inner sleeve concentric with said area of peak crimp force....”

Applicant’s independent Claim 11 requires:

“A reinforced hose coupling comprising:
a hose...;
an outer sleeve...having a plurality of depressions...;
an inner sleeve having an inner diameter...; and
at least one reinforcing ring situated within said inner
diameter of said inner sleeve, said at least one reinforcing ring positioned
between said plurality of depressions of said outer sleeve....”

Applicant’s independent Claim 12 requires:

“A reinforced hose coupling comprising:
a hose...;
an outer sleeve...having at least one depression...;
an inner sleeve having an inner diameter...; and
at least one reinforcing ring situated within said inner
diameter of said inner sleeve, said at least one reinforcing ring being
positioned concentrically with said at least one depression of said outer
sleeve....”

Accordingly, the Joseph et al. reference fails to disclose each and every element arranged as in Applicant’s independent claims. Specifically, Joseph et al. fail to disclose a reinforcing ring. Joseph et al. also fail to disclose the reinforcing ring being positioned concentric with an area of peak crimp force (as in Claim 1), whether that peak crimp force is between depressions of an outer sleeve (as in Claim 11) or is concentric with such depressions (as in Claim 12).

Applicant’s invention specifically requires a ring, and not a tubular liner as disclosed in Joseph et al. A ring is circular, as in a circular band of metal. In contrast – by definition of the base word tube – a tubular liner is cylindrical, as in an elongated cylindrical

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body that is used especially to convey fluids. See *Merriam-Webster's Unabridged Dictionary* 2000 and *Science Navigator* by McGraw-Hill 1998. A ring, as opposed to a tubular liner, is relevant to the benefits and advantages of the present invention over the prior art, as clearly set forth in the specification.

Based upon the above argument, Applicant respectfully submits that the Joseph et al. reference does not disclose each and every element arranged as in the claim of any of Applicant's independent claims. Therefore, in applying the test for anticipation as set forth in *Lindemann*, Joseph et al. do not anticipate independent Claims 5, 11, or 12. Further, under principles of claim dependency, Joseph et al. do not anticipate any of the dependent claims either. Accordingly, reconsideration and withdrawal of the rejection of Claims 5, 11, and 12 under 35 U.S.C. §102(b) is respectfully requested.

Finally, Applicant's invention is not an obvious improvement over the prior art.

Joseph et al. is directed to the problem of using heavy gage cylindrical couplings and collars for fluid conduit assemblies. To overcome this problem Joseph et al. teach a tube coupling fabricated from a lightweight aluminum material having a tubular liner to prevent deformation to the coupling during a crimping operation.

To accomplish the teachings, Joseph et al. disclose a tubular coupling fabricated from aluminum that includes the tubular liner having a predetermined length and being press-fit into the tubular connector body. The tubular liner provides structural rigidity and strength to the aluminum connector thereby protecting the coupling from deforming under the crimping force required to connect the tubular connector body to the end of the rubber hose. Furthermore, Joseph et al. disclose that the tubular liner is formed from a different material than the material of the coupling body to increase the structural rigidity of

the body. It is important to point out that the Joseph et al. reference is completely silent regarding teachings of using a reinforcing ring strategically positioned within a coupling to resist deformation of an a selective portion of inner sleeve of the coupling during a crimping operation.

Applicant's invention is directed to problems in the prior art associated with couplings that are relatively weaker under crimping operations and that are relatively more expensive and heavier. Applicant teaches use of a hose coupling that incorporates a relatively cheaper and lighter reinforcement member that provides stronger resistance against deformation during crimping operations on the coupling. Applicant discloses the hose coupling having an inner sleeve, an outer sleeve coaxial with the inner sleeve, and a hose coaxially positioned therebetween. A reinforcing ring is strategically positioned within a selective portion of the inner sleeve in alignment with an area of peak crimp force exerted during a crimping operation associated with manufacturing the coupling.

Clearly, there are significant differences between Applicants' invention and Joseph et al. First, as set forth above, Applicant's invention specifically requires a ring, and not a tubular liner as disclosed in Joseph et al. This is relevant since a ring necessarily requires relatively less material and thus cost and weight are less than a tubular liner of similar cross-sectional dimension. Additionally, a reinforcement ring strategically placed in alignment with a predicted area of failure of the coupling is stronger. This is because a relatively longer tubular liner suffers from the detrimental effects of appreciable cumulative beam deflection along its relatively long length. In contrast, a relatively discrete ring does not experience any such appreciable cumulative beam deflection and provides support that is more concentrated and more efficient.

Finally, Applicant solved a general long-felt but unsolved need in the crowded prior art of hose couplings. Reduction of part costs as well as reduction in the weight of hose couplings is an ongoing need in this mature and competitive industry. Up until Applicant's invention, no one has recognized, much less suggested or used, a reinforcing ring strategically positioned within a hose coupling to resist deformation thereof during a crimping operation. Therefore, Applicant's invention is not obvious, or else it would already have been quickly proposed in this very crowded art, since it is so effective and relatively inexpensive and since there has been ample opportunity to suggest it. Therefore, Applicant's invention addresses and makes yet another significant step toward reduction of complexity and costs of hose couplings.

Accordingly, Applicant's invention is an unobvious improvement over the prior art and not an obvious modification of any of the references of record in this application. When viewed singularly or collectively, none of the prior art references disclose, teach, or suggest a hose coupling having a reinforcing ring positioned within an inner sleeve to provide concentrated and localized reinforcement to ensure integrity and long-term durability of the coupling and, in fact, Applicant performs this for the first time.

In view of the foregoing remarks, the undersigned agent respectfully submits that the pending independent and dependent claims are in proper form, define patentably over the prior art, and are clearly allowable. Applicant's agent, therefore, respectfully requests that the Examiner's rejections under 35 U.S.C. §102 be reconsidered and withdrawn and that a formal Notice of Allowance be issued therefor.

In accordance with 37 CFR §1.121, a clean copy of amended Claim 6 omitting bracketed text and underlining, is included herewith as Exhibit A. Similarly, a

clean copy of the amended paragraphs of the specification and the Abstract as pending in the application is included herewith as Exhibit B.

If the Examiner has any questions with respect to any matter now of record, Applicant's agent may be reached at (248) 362-1210.

Respectfully submitted,

VANOPHEM & VANOPHEM, P.C.



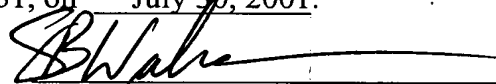
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Certificate under 37 CFR §1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on July 30, 2001.

Date: July 30, 2001



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